WHAT IS CLAIMED IS:

1. A process for producing a mesostructured thin film having an oriented rod-like pore structure, comprising the step of forming the mesostructured thin film on a polymer compound containing a sequence of two or more adjacent methylene groups in a molecular structure of the repeating unit of the polymer compound.

2. The process for producing a mesostructured thin film according to claim 1, wherein the process comprises the step of preparing the polymer compound.

3. The process for producing a mesostructured thin film according to claim 2, wherein the step of preparing the polymer compound is the step of forming a film of the polymer compound on a base plate.

4. The process for producing a mesostructured thin film according to claim 2, wherein the step of preparing the polymer compound is the step of forming a Langmuir-Blodgett film as the film of the polymer compound.

5. The process for producing a

mesostructured thin film according to claim 1, wherein the mesostructured thin film is formed on the polymer compound which has orientation.

6. The process for producing a mesostructured thin film according to claim 5, wherein the orientation of the polymer compound is uniaxial orientation.

5 ~~7~~. The process for producing a mesostructured thin film according to claim 1, wherein the mesostructured thin film contains silicon.

6 ~~8~~. The process for producing a mesostructured thin film according to claim 5 ~~7~~, wherein the mesostructured thin film contains silica.

7 ~~9~~. The process for producing a mesostructured thin film according to claim 1, wherein the mesostructured thin film is formed by hydrolyzing a silicon alkoxide.

8 ~~10~~. The process for producing a mesostructured thin film according to claim 1, wherein the mesostructured thin film is formed by hydrolysis reaction in the presence of a surfactant.

9 ~~11~~. The process for producing a mesostructured thin film according to claim 8 ~~10~~, wherein the surfactant is a quaternary alkylammonium salt.

10 ~~12~~. The process for producing a mesostructured thin film according to claim 8 ~~10~~, wherein the surfactant contains a polyethylene oxide as the hydrophilic group.

11 ~~13~~. The process for producing a mesostructured thin film according to claim 8 ~~10~~, further comprising the step of removing the surfactant after forming the mesostructured thin film.

12 ~~14~~. The process for producing a mesostructured thin film according to claim 11 ~~13~~, wherein the step of removing the surfactant is the step of baking the mesostructured thin film.

13 ~~15~~. The process for producing a mesostructured thin film according to claim 11 ~~13~~, wherein the step of removing the surfactant is the step of removing the surfactant by solvent-extraction.

14 ~~16~~. The process for producing a mesostructured thin film according to claim 1, wherein the mesostructured thin film is formed by hydrolysis

reaction under an acidic condition.

15 ~~17~~. The process for producing a mesostructured thin film according to claim 1, wherein the mesostructured thin film is formed by bringing a solution containing a material for the mesostructured thin film into contact with a surface of the polymer compound.

16 ~~18~~. The process for producing a mesostructured thin film according to claim 1, wherein a surface of the polymer compound is subjected to rubbing treatment before the formation of the mesostructured thin film.

17 ~~19~~. The process for producing a mesostructured thin film according to claim ~~18~~ 16, wherein the rubbing treatment is conducted in a direction perpendicular to the mesochannels of the mesostructured thin film to be formed.

18 ~~20~~. The process for producing a mesostructured thin film according to claim 1, wherein the number of a sequence of adjacent methylene groups in the repeating unit of the polymer compound ranges from 2 to 20.

19 ~~21~~. The process for producing a mesostructured thin film according to claim 1, wherein the sequence of adjacent methylene groups in the repeating unit of the polymer compound is contained in the main chain of the polymer compound.

20 ~~22~~. The process for producing a mesostructured thin film according to claim 1, wherein the sequence of adjacent methylene groups in the repeating unit of the polymer compound is contained in the side chain of the polymer compound.

~~23~~. A mesostructured thin film having an oriented rod-like pore structure formed on a polymer compound, the polymer compound containing a sequence of two or more adjacent methylene groups in a molecular structure of the repeating unit of the polymer compound.

24. The mesostructured thin film according to claim 23, wherein the polymer compound is a surface of a Langmuir-Blodgett film of the polymer compound.

25. The mesostructured thin ~~film~~ according to claim 23, wherein the polymer compound has orientation.

26. The mesostructured thin film according to

claim 25, ~~wherein the orientation of the polymer~~ compound is uniaxial orientation.

27. The mesostructured thin film according to claim 23, wherein the mesostructured thin film contains silicon.

28. The mesostructured thin film according to claim 23, wherein the mesostructured thin film contains silica.

29. The mesostructured thin film according to claim 23, wherein the mesostructured thin film is formed by hydrolyzing a silicon alkoxide.

30. The mesostructured thin film according to claim 23, wherein the mesostructured thin film is formed by hydrolysis reaction in the presence of a surfactant.

31. The mesostructured thin film according to claim 23, wherein the mesostructured thin film has a hollow structure.

32. The mesostructured thin film according to claim 23, wherein the polymer compound is subjected to rubbing treatment before the formation of the

mesostructured thin film.

33. The mesostructured thin film according to claim 32, wherein the rubbing treatment is conducted in a direction perpendicular to mesochannels of the mesostructured thin film to be formed.

34. The mesostructured thin film according to claim 23, wherein the number of a sequence of adjacent methylene groups in the repeating unit of the polymer compound ranges from 2 to 20.

35. The mesostructured thin film according to claim 23, wherein the sequence of adjacent methylene groups in the repeating unit of the polymer compound is contained in the main chain of the polymer compound.

36. The mesostructured thin film according to claim 23, wherein the sequence of adjacent methylene groups in the repeating unit of the polymer compound is contained in the side chain of the polymer compound.